The dissolution of kaolin by acidic fluoride wastes

The potential use of kaolin as a lining material for the storage of acidic and acidic fluoride wastes is investigated. No significant changes are observed gravimetrically or structurally for kaolin soaked under acidic conditions down to pH 2 for periods up to 90 days. Some release of aluminium was noted with decreasing pH. Severe kaolin dissolution was apparent, however, when soaked in solutions less than pH 3 to 4 with a fluoride concentration of 0.05 M. Aluminium-oxygen bonding in kaolin appears to be substantially more prone to hydrofluoric acid attack than does silicon-oxygen bonding, resulting in a preferential release of aluminium over silicon into solution. The solution pH was found to decrease with the dissolution reaction as fluorsilicic acid was produced during the kaolin breakdown.

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